

# Progressive Cavity Pumps Gain Acceptance in Chemical Metering Applications

How one water plant's positive experiences with PC pumps in traditional applications paved the way for innovative and creative uses.

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**PC pumps are very commonly used for sludge applications, but what you may not know is that these pumps are also well suited for process control in chemical feed applications.**

The American Water Works Association is publishing a new Standard called ANSI/AWWA E200 Progressive Cavity Chemical Metering Pumps. The standard provides minimum requirements for progressive cavity chemical metering pumps used with polymers and aggressive chemicals including sodium hypochlorite (NaOCl), ferric chloride (FeCl<sub>3</sub>), sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) hydrochloric acid (HCl), other strong acids and bases. The standard includes design, materials, application, testing and delivery of these metering pumps. Initiatives such as this standard are evidence of progressive cavity pumps gaining acceptance in chemical metering applications. They are gaining acceptance because PC pumps offer several advantages compared to conventional chemical metering pumps due to accurate, repeatable metering with low shear, laminar flow, and minimal pulsation and vapor lock. Some process owners may accept that conventional chemical metering pumps are always subject to heavy monitoring, frequent parts replacement, and disposal on a regular basis. These practices cause unplanned variances, downtime, increased cost and water quality concerns. The City of West Palm Beach, Florida discovered this truth firsthand in updating their approach to chemical feed applications.

The City's water treatment plant is rated for 47.3 million gallons of water per day and uses

a wide variety of chemicals to accomplish their task. The City is also responsible for a number of remote pumping and booster stations. Rick Smith, maintenance supervisor, has been with the City for about 10 years now. Smith had positive experiences at a previous plant he worked for with PC pumps on a skid to transfer polymer from a mix tank to a flocculation basin. When he first started working in West Palm Beach and began experiencing unsatisfactory results with diaphragm pumps handling sodium hypochlorite (bleach), he recalled how easy PC pumps were to maintain. The diaphragm pumps often required attention on the weekends for de-gassing, and backpressure valves and diaphragms always needed replacement. This was a burdensome maintenance routine for his operators. Another problem is that the diaphragm pumps were wired

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Rick Smith  
Maintenance Supervisor,  
West Palm Beach



into DC drives with programmable logic. If the pump broke down, the drive would have to come out as well because it could no longer communicate with their control board properly. The City had a “trailer full” of metering pumps actively being worked on at any given time, to ultimately be disposed of. Since the City was already using PC pumps that required very little work for sludge, Rick suggested to Director of Operations, Poonam Kalkat, who was the Water Plant Manager at the time, “Let’s give PC pumps a try for bleach.” He said, “We put them in and haven’t looked back yet.”

The City now has four chemical metering systems equipped with SEEPEX PC Intelligent Metering Pumps (IMPs) with Variable Frequency Drives (VFDs) for sodium hypochlorite applications. They have three more PC IMPs pumping ammonia. For polymer, caustic, ferric, and alum, they rely on 10 additional standard PC metering pumps. The advantages they’ve uncovered are easier and fewer maintenance requirements. Accurate metering is also a benefit. The City uses PC pumps to pump alum for its stormwater treatment system which used to be “hit and miss” on dosing the right amount of chemical before using PC pumps. Accurate metering provided cost savings and regulatory compliance for this high profile alternate water project. Smith said his operators also like that the VFDs provide well integrated control that is simple to use. If the PC IMPs need to be cleared, then operators can run them forward or backward. He also explains that the plant is prone to power hits, and even still he can’t remember a time when VFDs gave him any trouble, unlike the DC drives used previously. He said, “The IMPs with VFDs

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The City is enjoying the benefits of PC pump technology even in ways they would not have imagined had they not tried them in more traditional applications first. For example, Smith explained that his team once had trouble with polymer tanks not mixing at a dewatering press. They didn’t have access to a mixer at hand, so they quickly installed a couple of small PC pumps to recirculate the 20-foot tall tanks, just like mixers would have. With any other pump, this would not have been possible. The City also used PC pumps in a wet, outdoor environment for over a year to dose low levels of chlorine to raw water feed lines for algae control. The City has also received regulatory approval to use the PC pumps at the remote booster stations as part of project to replace the use of chlorine gas with liquid bleach. This project is expected to be completed by mid-2018.

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